NON-PUBLIC?: N
ACCESSION #: 9012270013
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Callaway Plant Unit 1 PAGE: 1 OF 04

DOCKET NUMBER: 05000483

TITLE: Reactor Trip On Low Steam Generator Level Which Resulted From a Turbine Trip On A Spurious Moisture Separator Reheater High Level Signal
EVENT DATE: 11/24/90 LER #: 90-016-00 REPORT DATE: 12/21/90

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 48

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Karl Evans, Supervising Engineer, TELEPHONE: (314) 676-8645
Instruments & Controls

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: Yes

EXPECTED SUBMISSION DATE: 07/01/91

ABSTRACT:

On 11/24/90 at 0051 CST, with power being reduced at 20 percent per hour, a turbine trip occurred on a high Moisture Separator Reheater (MSR) high level signal. A reactor trip occurr
d within ten seconds due to low
steam generator levels which had resulted due to the turbine trip. Engineered Safety Features Feedwater Isolation and, Auxiliary Feedwater Actuation were generated per design. The licensed operators immediately stabilized the plant in accordance with plant procedures. The plant was at 48 percent reactor power at the time of the trip, with reactor coolant system temperature at 571 degrees F and pressure at 2235 psig.

One MSR level device was inadvertently installed upside down, causing one high level signal to lock in. The spurious actuation of the second MSR level channel is attributed to vibration caused by the power reductions, This made up the two out of three logic for the MSR level trip signal. Due to narrow trip and reset tolerance, the MSR level devices were very sensitive to vibration. An actual high MSR level had not occurred.

The incorrectly installed MSR level switch was inverted and all 12 switches were adjusted to make them less susceptible to vibration-induced spurious actuations. Other similar level switches in the plant are being evaluated for potential set-up problems due to tight calibration tolerances.

END OF ABSTRACT

BASIS FOR REPORTABILITY

On 11/24/90 at 0051 CST, a turbine 1_/ trip occurred due to a spurious 'A' Moisture Separator Reheater (MSR) 2_/ high level trip. Subsequent low Steam Generator (S/G) 3_/ levels initiated a Reactor Protection System (RPS) reactor trip. As a result of the RPS actuation, a Feedwater Isolation (FWIS) and Auxiliary Feedwater Actuation (AFAS) were generated by design. Since these actuations were not part of a preplanned sequence during reactor operation or testing, this event is reportable per 10 CFR 50.73 (a)(2)(v).

PLANT CONDITIONS AT TIME OF EVENT

Mode 1 - Power Operations
48 percent Reactor Power at time of the trip
Reactor Coolant System (RCS) 4_/ : Temperature (average) - 571 degrees F; Pressure - 2235 psig.

DESCRIPTION OF EVENT

A plant shutdown was commenced at approximately 2300 because RCS sulfate levels exceeded vendor recommendations for continuous operation. At 0051, with the plant at 48 percent power and load being reduced at 20 percent per hour, a turbine trip occurred on a high MSR level signal.

A reactor trip occurred within ten seconds due to low steam generator levels (5) which had resulted due to the turbine trip. Engineered Safety Features (ESF) 5_/ FWIS and AFAS actuations occurred in accordance with plant design. Plant equipment operated as designed to perform its safety

function, however, steam generator levels did not respond as expected based on power generation design basis. The licensed operators immediately stabilized the plant in accordance with plant procedures. The plant was restored to full power operation at 1808, on 11/25/90.

ROOT CAUSE

1. One of the three 'A' MSR level devices 6_/ had been inadvertently installed upside down by utility Instrument and Controls (I&C) technicians on 10/30/90, causing one high level signal to lock in, thus reducing the MSR turbine trip logic to 1 out of 2. The procedures/work instructions failed to ensure proper performance of this work activity.

2. The spurious actuation of the second MSR level channel is attributed to the narrow trip and reset tolerance values. This resulted in the MSR level device switches being set in such a way that the switch action was very sensitive to vibration. The second channel probably tripped due to the vibrations caused by the power reductions. An actual high MSR level had not occurred.

3. Under the Final Safety Analysis Report power generation design basis III for the steam dumps, the plant should be capable of withstanding a 50% electrical step load reduction without reactor trip. However, in this specific case, the initial conditions were more restrictive than those assumed in the transient analysis.

CORRECTIVE ACTIONS

1. The incorrectly installed MSR level switch was inverted and correctly calibrated. More detailed procedures/work instructions will be provided for use prior to the next calibration of these switches. This will ensure proper set-up of the switch as well as the 2 out of 3 logic verification.

2. All 12 switches were adjusted to achieve a more positive actuation that would make them less susceptible to vibration-induced spurious actuations. Other similar level switches in the plant are being evaluated for potential set-up problems due to tight calibration tolerances.

3. An evaluation will be performed to verify plant performance observed during this event is consistent with the existing 50% load reduction transient analysis.

SAFETY SIGNIFICANCE

The plant safety systems performed as required. There was no detrimental effect on plant equipment as a result of the actuations. There was no threat to the health and safety of the public.

PREVIOUS OCCURRENCES

None

FOOTNOTES

The system and component codes below are from the IEEE Standards 805-1983 and 803A-1983, respectively.

1. System - TA, Component - TRB
2. System - SB, Component - RHTR
3. System - AB, Component - SG
4. System - AB
5. System - JE
6. System - SB, Component - LS

UNION
ELECTRIC
Callaway Plant

December 21, 1990

U. S. Nuclear Regulatory Commission
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ULNRC-2347

Gentlemen:

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
FACILITY OPERATING LICENSE NPF-30
LICENSEE EVENT REPORT 90-016-00
REACTOR TRIP ON LOW STEAM GENERATOR LEVEL WHICH

RESULTED FROM A TURBINE TRIP ON A SPURIOUS MOISTURE SEPARATOR REHEATER HIGH LEVEL SIGNAL

The enclosed Licensee Event Report is submitted pursuant to 10 CFR 50.73 (a)(2)(v) concerning a turbine trip due to a spurious moisture separator reheater high level signal. The subsequent low steam generator levels resulted in a reactor trip and engineered safety feature actuations.

J. D. Blosser
Manager, Callaway Plant

JDB/TPS/MKD/djr

Enclosure

cc: Distribution attached

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cc distribution for ULNRC-2347

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